

ABSTRACT OF THE DISCLOSURE

An optical measuring device having multiple optical paths between one or more light emitters and one or more light detectors and/or providing at least two sets of wavelength of light along at least one path, with a final measurement being produced as a combination of measurements of the sets of wavelengths of light taken along one or more of the optical paths. Features that contribute to increased safety and ease of use include providing (1) a receiving cavity in a proximal end of an insertion rod that holds a free end of a circuit connector to keep it from becoming tangled or snagged, (2) a mechanism to keep the sensor within an introducer tube during storage and insertion and to expose a portion of the sensor only when the sensor is applied to the unborn baby, (3) a tab on the insertion rod to prevent the circuit connector from becoming tangled or snagged within the introducer tube, (4) a rotating feature whereby if a torque applied on the sensor exceeds a first predetermined amount, the sensor rotates, and a disengaging feature whereby the sensor detaches from insertion rod if a pull-off force exceeds a second predetermined amount, the rotating and disengaging features being independent of one another, (5) a circuit connector that includes at least one of the following features: (a) a stiffening member provided at the proximal end to minimize bending, (b) a shielding layer, and (c) at least one slit to increase the flexibility of the circuit connector, and (6) an interface that includes an identification element that is detected by an external circuit only if the circuit connector is connected to the interface. The present invention also pertains to a method of manufacturing a needle that is used in an invasive sensor, and preferably for fetal monitoring, that provides features not heretofore available in conventional sensors.